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Francis A. Cooch, Office of Patent Counsel
The Johns Hopkins University
Applied Physics Laboratory
11100 Johns Hopkins Road
Laurel, MD 20723-6099

EXAMINER	
KISH, JAMES M	

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CRAIG A. KELLY

Appeal 2009-007489
Application 10/687,230
Technology Center 3700

Decided: March 25, 2010

Before LINDA E. HORNER, JENNIFER D. BAHR and
STEVEN D.A. McCARTHY, *Administrative Patent Judges*.

McCARTHY, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellant appeals under 35 U.S.C. § 134 (2002) from the Examiner's decision finally rejecting claims 1-47 under 35 U.S.C. § 103(a) as being unpatentable over Meyer (US 6,308,098 B1, issued Oct. 23, 2001) and Sun (US 6,811,536 B2, issued Nov. 2, 2004). We have jurisdiction under 35 U.S.C. § 6(b) (2002).

Dismissal of the Appeal as to Claims 24-47

The Examiner has entered a new ground of rejection in the Examiner's Answer against claims 24-47 under § 101 as being directed to nonstatutory subject matter. (Ans. 3.) The Examiner properly gave notice of the new ground of rejection. (*Id.*; Ans. 9-10.) The Technology Center Director approved the new ground of rejection. (Ans. 10.) As the Answer indicates (Ans. 9-10), the Appellant was required to respond to the new ground within two months in either of two ways: 1) reopen prosecution, *see* 37 CFR § 41.39(b)(1); or 2) maintain the appeal by filing a reply brief as set forth in 37 CFR 41.41, *see* 37 CFR § 41.39(b)(2), "to avoid *sua sponte* dismissal of the appeal as to the claims subject to the new ground of rejection." (Ans. 9.) *See also* 37 CFR § 41.39(b). According to the record before us, the Appellant does not appear to have exercised either option.

Accordingly, we DISMISS the appeal as to the claims subject to the new ground of rejection under § 101, namely, claims 24-47. Given that the appeal stands dismissed as to claims 24-47, the sole ground of rejection before us for review is the rejection of claims 1-23 under § 103(a) as being unpatentable over Meyer and Sun.

We do not sustain the rejection of claims 1-23. Pursuant to 37 C.F.R. § 41.50(b), we enter a NEW GROUND OF REJECTION against claims 1 and 23 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Reversal of Rejections of Claims 1-23 under § 103(a)

Claims 1, 2, 12, 13 and 23 are independent.

Claim 1 recites:

1. A non-invasive health monitor device comprising:

a processor;

a processor readable storage medium;

code recorded in the processor readable storage medium to create a first array of data based on discretely recorded time events in which each element of the first array is representative of a time when an event took place;

code recorded in the processor readable storage medium to create a second array of data in which each element of the second array is an interval representative of the difference between successive elements of the first array;

code recorded in the processor readable storage medium to create a third array of data in which each element of the third array is a delta interval representative of the difference between successive elements of the second array;

code recorded in the processor readable storage medium to perform a fast fourier transform (FFT) to obtain power spectrum data representative of the third array; and

code recorded in the processor readable storage medium to integrate the power spectrum data over frequency ranges of interest to obtain discrete power values for said frequency ranges of interest.

Claim 23 differs from claim 1 only in that each element of the third array of data is a delta interval representative of the difference between *non-successive* rather than successive elements of the second array.

Claims 2, 12 and 13 each claim non-invasive health monitor devices. The device of claim 2 includes "code recorded in the processor readable storage medium to create a delta heart period interval array in which each element is a delta heart period interval representative of the difference between successive elements of [a] heart period interval array." The device of claim 12 includes "code recorded in the processor readable storage medium to create a delta respiration period interval array in which each element is a delta respiration period interval representative of the difference between successive elements of [a] respiration period interval array." The device of claim 13 includes "code recorded in the processor readable storage medium to create a delta ventricular systole interval array in which each element is a delta ventricular systole interval representative of the difference between successive elements of [a] ventricular systole interval array."

The Examiner provides no clear statement of findings as to the differences between the claimed subject matter and the prior art, namely, the disclosure of the primary reference Meyer. (*See* Ans. 4-5; Final Office Action mailed Sep. 18, 2007 at 3-5; *see also* Ans. 8.) The Examiner fails to articulate any reasoning to explain how the combined teachings of Meyer and Sun would have provided one of ordinary skill in the art reason to *modify* the disclosure of Meyer to provide code to create a "third array of data" as recited in claims 1 and 23; a "delta heart period interval array" of claim 2; a "delta respiration period interval array" as recited in claim 12; or a "delta ventricular systole interval array" as recited in claim 13. (*See id.*) This omission implies that the Examiner finds that Meyer discloses these limitations.

The Appellant argues that the "differential analysis step is not an established process or recognized as valuable in analysis of heart rate variability in the prior art . . . Applicant submits that the differential analysis processing step, as recited in all independent claims, is novel and a significant contribution to the measurement and interpretation of heart rate variability." (Br. 10.) The thrust of this argument is that the combined teachings of Meyer and Sun would have provided one of ordinary skill in the art no reason to program a processor to create the "third array of data" of claims 1 and 23; the "delta heart period interval array" of claim 2; the "delta respiration period interval array" of claim 12; or the "delta ventricular systole array" of claim 13.

The Examiner does not identify where Meyer discloses code to create any of these arrays. No such disclosure is evident.

Meyer discloses a cardiac pacemaker *100* with the capacity to detect whether a patient is standing or reclining using the morphology of an intracardial physiological sensor signal such as a signal representative of intracardial impedance. (Meyer, col. 2, ll. 6-14.) More specifically, Meyer's pacemaker *100* includes an impedance signal input stage *101*, an analog-to-digital converter *105*, an impedance signal memory unit *106*, a calibration unit *107* and an arithmetic stage *108*. The elements cooperate to calculate discrete values representing the slopes of an intracardial impedance curve at various time intervals. (Meyer, col. 3, ll. 38-63.) Meyer discloses that:

> A long-term slope memory *118*, in which (again according to the ["first in-first out"] principle) the slope values from a large number of impedance measurements are stored, is also

> connected to the output of the arithmetic stage *108*. A fluctuation curve determination stage *119*, in which the curve of the time variability of their fluctuations is determined for all currently stored slope signals, is connected to this. A frequency analyzer *120* for determination of the spectral power density of the fluctuation curve using a linear model of the so-called autoregressive spectral analysis (ARSA) stored in a frequency analysis program memory *121* is connected downstream from this. An integrator stage *122* for integration of the frequency components within the two permanently programmed ranges of 0.05 to 0.15 Hz ("LF") and 0.15 to 0.4 Hz ("HF") is connected to the output of the frequency analyzer *120*.

(Meyer, col. 4, ll. 28-43.)

Although the Examiner paraphrases this passage from Meyer in the statement of the grounds of rejection, the Examiner fails to identify how this passage discloses code to create a "third array of data" as recited in claims 1 and 23; a "delta heart period interval array" as recited in claim 2; a "delta respiration period interval array" as recited in claim 12; or a "delta ventricular systole interval array" as recited in claim 13. (*See* Ans. 4-5; Final Office Action mailed Sep. 18, 2007 at 3-5; *see also* Ans. 8.) In particular, the Examiner fails to provide reasoning to explain why Meyer's description of "a fluctuation curve determination stage *119*, in which the curve of the time variability of their fluctuations is determined for all currently stored slope signals, is connected to" the long-term slope memory *118* necessarily discloses these limitations. (*See id.*)

Meyer's statement of the "Objects and Summary of the Invention" describes a process for determining whether a patient is standing or reclining

which does not include a differential analysis or the creation of a delta interval array analogous to the "third array of data" of claims 1 and 23; the "delta heart period interval array" of claim 2; the "delta respiration period interval array" of claim 12; or the "delta ventricular systole interval array" of claim 13. (*See* Meyer, col. 2, ll. 35-58.) Meyer's failure to disclose either a differential analysis or the creation of a delta interval array in the "Objects and Summary of the Invention" indicates that no such disclosure was intended in Meyer's "Detailed Description of the Invention."

Sun does not remedy the deficiencies of Meyer. Sun teaches determining a heart rate representative of the reciprocals of the time intervals between the peaks of signals of measured blood pressure or electrocardiography. (Sun, col. 3, ll. 61-64.) Sun further teaches converting the heart rate to a power spectrum by use of a fourier transform method; separating the power spectrum into high frequency, low frequency and very low frequency variability ranges; and integrating the portion of the power spectrum within each frequency range. (Sun, col. 3, l. 64 – col. 4, l. 4.) Sun fails to disclose creating any array which might correspond to the "third array of data" of claims 1 and 23; the "delta heart period interval array" of claim 2; the "delta respiration period interval array" of claim 12; or the "delta ventricular systole interval array" of claim 13.

The Examiner has not shown code to create an array corresponding to the "third array of data" of claims 1 and 23; the "delta heart period interval array" of claim 2; the "delta respiration period interval array" of claim 12; or the "delta ventricular systole interval array" of claim 13. The Examiner has not articulated any reasoning which might suggest why one of ordinary skill in the art familiar with the combined teachings of Meyer and Sun might have

reason to modify Meyer's pacemaker *100* to include these limitations of claims 1, 2, 12, 13 and 23. We do not sustain the rejections of claims 1, 2, 12, 13 and 23 under § 103(a) as being unpatentable over Meyer and Sun. Neither do we sustain the rejections of dependent claims 3-11 and 14-22 under § 103(a).

New Ground of Rejection of Claims 1 and 23 under § 101

Pursuant to 37 C.F.R. § 41.50(b), we enter a new ground of rejection of claims 1 and 23 under § 101 as being directed to non-statutory subject matter.

Subsequent to the mailing of the Examiner's Answer, the Board clarified the scope of statutory subject matter relating to claims reciting machines. A claim to a machine reciting a mathematical algorithm fails to recite statutory subject matter if the claim is not limited to a tangible practical application, in which the mathematical algorithm is applied, that results in a real-world use and not a mere field-of-use label having no significance. *Ex Parte Gutta*, 93 USPQ2d 1025, 1028 (BPAI 2009).

Claims 1 and 23 recite machines. Each recites a "non-invasive health monitor device" including at least a processor and a processor readable storage medium.

Claims 1 and 23 each recite a mathematical algorithm. Indeed, claims 1 and 23 recite no more than the processor, the processor readable storage medium and code for instructing the processor how to perform a mathematical algorithm.

Claims 1 and 23 are not limited to *tangible* practical applications. Each recites code to create a first array of data based on discretely recorded

time events. Neither claim 1 nor claim 23 limits the manner in which the "data" is obtained. Although both claims require that the "time events" be "discretely record[ed]," neither limits the nature of the "time events" or requires that the time events represent physical events. Each claim also recites code for carrying out four other steps based solely on the first array of data. Nothing recited in claim 1 or claim 23 limits the use of the algorithm to data representing physical objects or real-world process parameters.

Claims 1 and 23 do not require that the performance of the algorithm result in a real-world use. The sole result of the algorithm which the code instructs the processor to perform is "discrete power values for . . . frequency ranges of interest." The discrete power values are not limited to representations of physical objects or real-world process parameters because the power values are derived from "discretely recorded time events" which themselves need not represent physical objects or real-world process parameters. Neither claim requires that any process step be performed in dependence on the magnitude of the discrete power values.

Although the preambles of claims 1 and 23 each recite a "non-invasive health monitor device," this recitation merely identifies an intended use of the claimed device rather than a structural limitation. Neither the body of claim 1 nor the body of claim 23 recites any structure specific to non-invasive health monitoring. Neither claim recites a limitation in the body which relies on the preamble for antecedent basis. Considering the claim language as a whole, the recitation of a "non-invasive health monitor device" in the preamble of each claim merely states a purpose or intended use for the claim and does not positively limit either claim. *See Pitney*

Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1305 (Fed. Cir. 1999)(discussing circumstances in which preamble recitation do, or do not, limit a claim). Hence, the preamble recitations of claims 1 and 23 are mere field-of-use labels having no significance in limiting claims 1 and 23 to statutory subject matter.

Considering the scope of claim 1 and of claim 23 as a whole, neither claim is directed to statutory subject matter.

DECISION

We DISMISS the appeal as to the claims subject to the Examiner's new ground of rejection under § 101, namely, claims 24-47.

Upon return of the application to the Examiner, the Examiner should:

(1) cancel claims 24-47; and

(2) notify the Appellant that the appeal as to the claims subject to the new ground of rejection under § 101 is dismissed and that claims 24-47 are cancelled.

See MANUAL OF PATENT EXAMINING PROCEDURE § 1207.03, 8th ed., Rev. 7, Jul. 2008.

We REVERSE the decision of the Examiner rejecting claims 1-23.

Pursuant to 37 C.F.R. § 41.50(b), we enter a NEW GROUND OF REJECTION of claims 1 and 23 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Under 37 C.F.R. § 41.50(b) a new ground of rejection has been entered. 37 C.F.R. § 41.50(b) provides that, "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

Regarding the new ground of rejection, Appellant must, *WITHIN TWO MONTHS FROM THE DATE OF THE DECISION*, exercise one of the following options with respect to the new ground of rejection, in order to avoid termination of the appeal as to the rejected claims:

> (1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner . . .
>
> (2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same record . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (2007).

REVERSED; 37 C.F.R. § 41.50(b)

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FRANCIS A. COOCH, OFFICE OF
PATENT COUNSEL
THE JOHN HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY
11100 JOHN HOPKINS ROAD
LAUREL, MD 20723-6099